

Appl. No. : 09/848,559
Filed : May 3, 2001

REMARKS

Rejection of Claims 1-27 Under 35 U.S.C. 112, Second Paragraph

The Examiner rejected Claims 1-27 under 35 U.S.C. 112, second paragraph, as being indefinite. With regard to Claim 1, the Examiner objected to the term “plurality of one core drivers” in line 8. Applicants have amended line 8 of Claim 1 to recite a “plurality of core drivers.” Claims 2-14 depend, directly or indirectly, from Claim 1, and the rejection of Claims 2-14 is traversed by the amendment to Claim 1. The Examiner objected to Claims 15 and 22 as being unclear if there are two secondary windings associated with the respective cores. Applicants have amended Claims 15 and 22 to clarify the claim by reciting “a secondary winding that links both said first transformer core and said second transformer core.” Claims 16-21 depend, directly or indirectly, from Claim 1, and the rejection of Claims 16-21 is traversed by the amendment to Claim 15. Claims 23-27 depend directly or indirectly from Claim 22, and the rejection of Claims 23-27 is traversed by the amendment to Claim 22.

In view of the above amendments, Applicants request the Examiner to withdraw the rejection of Claims 1-27.

Rejection of Claims 22-24 Under 35 U.S.C. 103(a)

The Examiner rejected Claims 22-24 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,412,254 to Robinson et al. (“Robinson”) in view of U.S. Patent No. 2,465,840 to Blumlein. Robinson teaches pairs of transformers, each transformer having two secondary windings connected in series with the series-connected secondary of the first transformer in the pair connected to the series-connected secondary of the pair. Each turn of each secondary winding links only one transformer core. Thus, a single turn of each winding links only a single core. By contrast, Claim 22 recites a system wherein each single turn of the secondary winding links multiple transformer cores.

In the system of Robinson, where each secondary has a number of turns and the secondary windings are connected in series, adding an additional transformer increases the actual number of secondary turns. Thus, in the system of Robinson, the number of actual secondary turns is proportional to the number of cores. By contrast, in Applicants’ claimed system, the number of actual turns in the secondary is independent of the number of transformer cores. The number of cores can be increased or decreased without changing the number of actual turns in the

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secondary. Thus, in Applicants' claimed system, the number of turns in the secondary can be chosen (e.g., to provide a desired impedance, voltage, etc.) independently of the number of cores. This flexibility is not available in the system of Robinson. Thus, the combination of Robinson with Blumlein does not yield Applicants' claimed invention.

Moreover, there is no suggestion to combine the teachings of Robinson and Blumlein. As explained in the specification on pages 10 and 11, the use of a Blumlein forming-line core driver provides several distinct advantages not recognized in the prior art. For example, when driving gas discharge loads, the load is extremely unstable and can change from a short circuit to an open circuit during the discharge. The forming-line driver generally provides some measure of independence between the switch and the load resistance. Further, the protection system to protect the switches is simplified by using the Blumlien forming line. These advantage were not previously recognized. Thus, the Examiner's combination of Robinson with Blumlein is based on hindsight.

Specifically, regarding Claim 22, the cited combination does not teach or suggest a pulse generator, having a first transformer core having a first primary winding, a second transformer core having a second primary winding, a core driver which produces a primary pulse and provides the primary pulse to the first primary winding, the core driver comprising a Blumlein; and, a secondary winding that links both the first transformer core and the second transformer core.

Regarding Claim 23, the cited combination does not teach or suggest the pulse generator of Claim 22, where the Blumlein includes first and second inductors.

Regarding Claim 24, the cited combination does not teach or suggest the pulse generator of Claim 23, where the first inductor comprises multiple turns with a capacitor provided to each turn.

Accordingly, Applicants assert that Claims 22-24 are allowable, and Applicants request allowance of Claims 22-24.

Rejection of Claim 35-36 Under 35 U.S.C. 103(a)

The Examiner rejected Claims 35 and 36 under 35 U.S.C. 103(a) as being unpatentable over Robinson et al. ("Robinson") in view of U.S. Patent No. 4,763,093 to Cirkel et al. ("Cirkel"). Robinson is discussed above. Cirkel teaches a high-current transformer having hollow

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winding with cooling fluid in the windings. Cirkel does not teach or suggest stacked cores. What might appear to be stacked cores in Figures 1 and 9 of Cirkel are section views of a single winding.

Regarding Claim 35, the cited combination does not teach or suggest a split-core transformer having a plurality of transformer cores each core having a separate primary winding, each of the separate primary windings linking only one of the transformer cores, and a secondary winding, the secondary winding linking all of transformer cores, the transformer cores arranged in two columns of cores such that a shape of the secondary winding approximates an oval racetrack.

As discussed above, in the system of Robinson, where each secondary has a number of turns and the secondary windings are connected in series, adding an additional transformer increases the number secondary turns. Thus, in the system of Robinson, number of actual secondary turns is proportional to the number of cores. By contrast, in Applicants' claimed system, the number of actual turns in the secondary is independent of the number of transformer cores. The number of cores (with corresponding primary windings) can be increased or decreased without changing the number of actual turns in the secondary. Thus, in Applicants' claimed system, the number of actual turns in the secondary can be chosen (e.g., to provide a desired impedance, voltage, etc.) independently of the number of cores. This flexibility is not available in the system of Robinson. Thus, the combination of Robinson with Blumlein does not yield Applicants' claimed invention.

Regarding Claim 36, the cited combination does not teach or suggest a split-core transformer having a plurality of transformer cores each with a separate primary winding. Moreover, neither Robinson nor Cirkel teaches or suggests the transformer cores arranged in circular fashion such that a shape of the secondary winding linking the cores approximates a circle.

Accordingly, Applicants assert that Claims 35 and 36 are allowable, and Applicants request allowance of Claims 35 and 36.

Rejection of Claim 37 Under 35 U.S.C. 103(a)

The Examiner rejected Claim 37 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,023,768 to Collier in view of Robinson. Collier teaches a high voltage high power DC power supply. An output of each secondary winding is converted to DC (rectified and filtered

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through a capacitor). The separate DC outputs are summed to produce a high-voltage DC output. It is well known in the art that transformers are AC devices. By teaching that the output of each secondary winding is rectified to make DC, Collier teaches away from combining secondary windings.

Collier and/or Robinson do not teach or suggest a split-core transformer having a plurality of toroidal magnetic cores each core having a separate primary winding, each of the separate primary windings linking only one of the toroidal magnetic cores, and a multi-turn secondary winding, the secondary winding linking all of the toroidal magnetic cores, the secondary winding linking each of the toroidal magnetic cores once per turn.

Accordingly, Applicants assert that Claim 37 is allowable, and Applicants request allowance of Claim 37.

Summary


The Examiner indicated that Claims 28-34 and 38 were allowable. In view of the above arguments and amendments, Applicants assert that Claims 1-38 are in condition for allowable and Applicants request allowance of Claims 1-38. If there are any remaining issues that can be resolved by a telephone call, the Examiner is invited to contact the undersigned Attorney at (949) 721-6305 or at the number listed below.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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Dated: _____

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